



August 5, 1993

Mr. Monica Rolluda
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Mail Stop HW-114
Seattle, Washington 98101

Subject: Site Inspection Prioritization - Level I
 King County Bow Lake Landfill (WAD980639231)
 Work Assignment C1003928
 Contract 068-W9-0009

Dear Ms. Rolluda:

PRC Environmental Management, Inc. (PRC) has completed a Level I site investigation prioritization (SIP) for the King County Bow Lake Landfill site in Tukwila, Washington. The evaluation was based primarily on information contained in the site file provided to PRC by the U.S. Environmental Protection Agency (EPA) and on information obtained from the Washington Department of Ecology (Ecology). Additional information was provided by other state and private agencies. Limited assumptions based on professional judgments were made in the absence of data as described below.

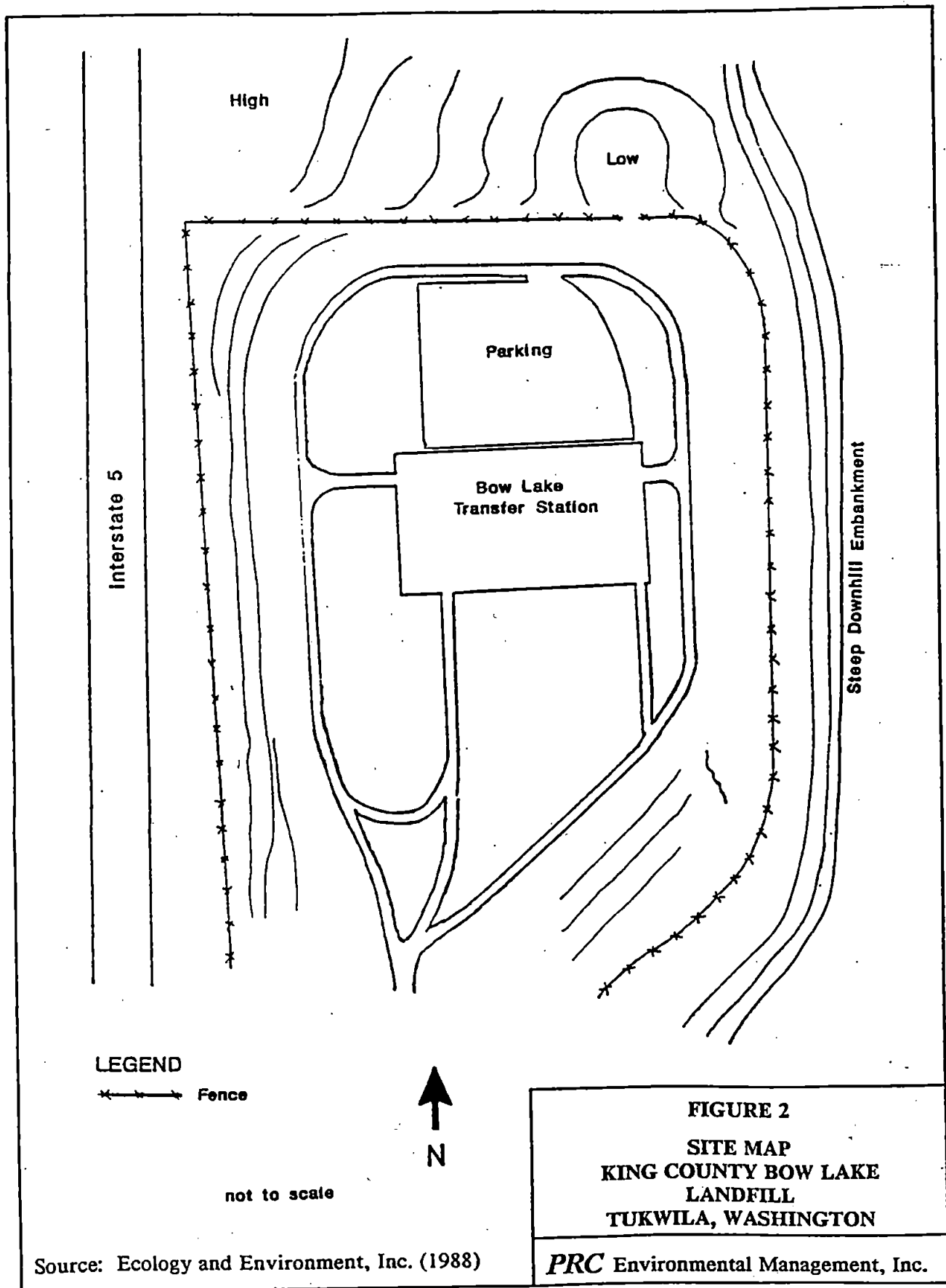
Background

The Bow Lake Landfill site is located at 188th Street and Military Road in Tukwila, Washington in Township 23 north, Range 4 east, Section 35 at 47°26'00" north latitude and 122°61'00" west longitude (Figure 1). The site is owned by King County and is now operated by King County Department of Public Works Solid Waste Division (KCSWD) as the Bow Lake Transfer Station. The transfer station and Interstate 5 (I-5) partially cover the former landfill (Figure 2).

The Bow Lake site operated as a municipal solid waste landfill from 1943 until its closure in 1963. No records indicate that hazardous wastes have been disposed of on site. However, it is known that municipal solid wastes contain household hazardous wastes, which account for about one percent of the total volume. The transfer station on site was constructed in 1961 and updated in 1978. In 1986, the transfer station processed an annual volume of 60,000 tons. The transfer station remains a major transfer point for South King County.

The transfer station grounds are enclosed by a chain-link fence. Based on historical aerial photographs, the landfill appears to extend beyond the confines of the fence along the north and east perimeters. The landfill's terrain slopes downhill from the west perimeter fence along I-5 toward the east before dropping steeply (12.5 percent) beyond the east perimeter fence.





The immediate terrain to the north, east, and south is currently undeveloped and inaccessible. The west perimeter fence is bordered by I-5.

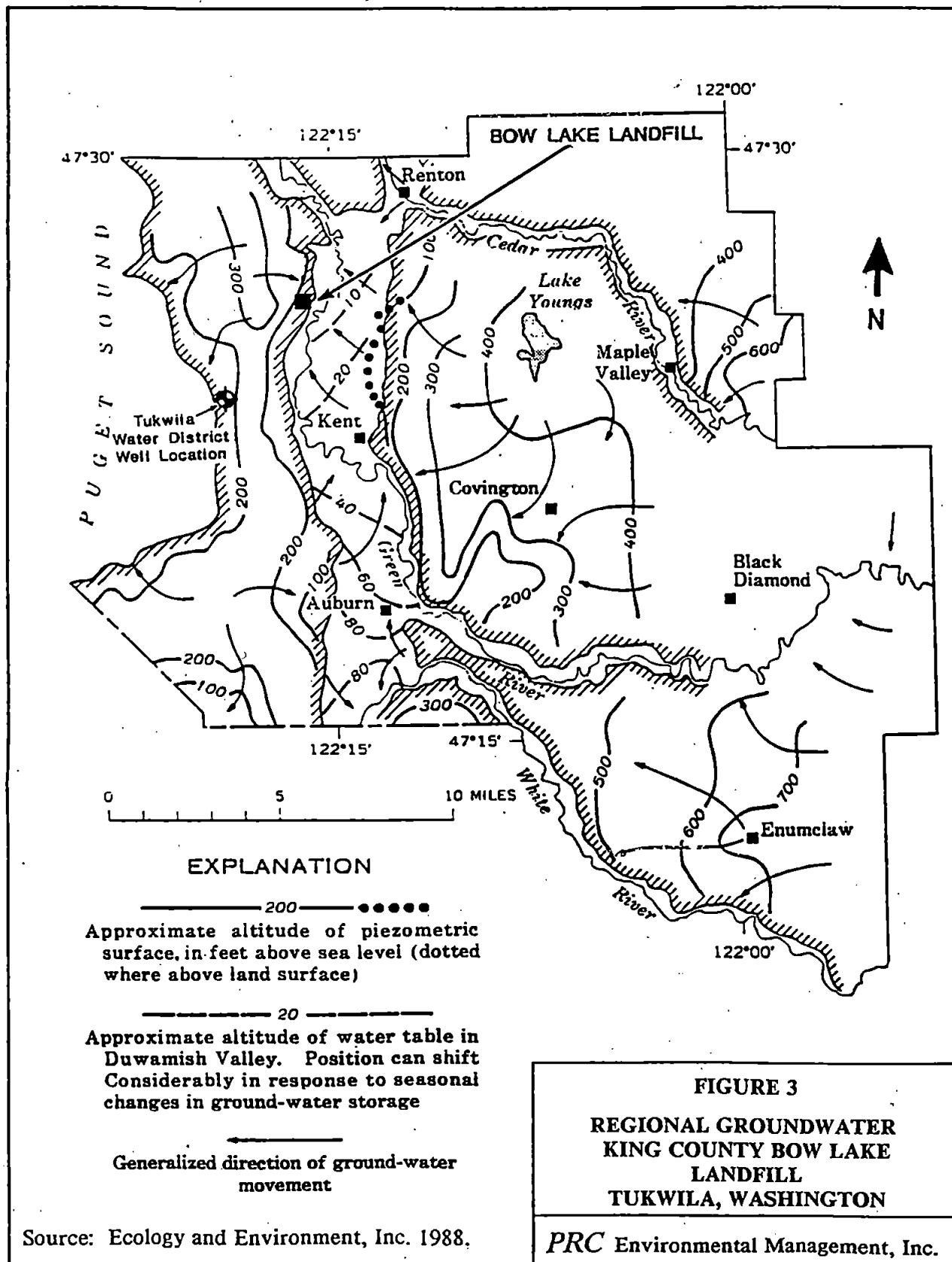
Land within 1 mile of Bow Lake Landfill is used for residential, industrial, and agricultural purposes. The site is located 1/4 west of Green River (becomes the Duwamish River), which flows north into Puget Sound. Angel Lake and Angel Lake Park are approximately 0.75 mile west of the landfill. Other landmarks in the vicinity of the landfill include Sea-Tac International Airport (1.5 miles west) and Southcenter shopping mall (2 miles north). Valley Ridge and Meander parks are also within 1 mile of the Bow Lake site.

Bow Lake Landfill is located upon a steeply sloping bluff that is a Kame-Terrace deposit composed of glacial till. The Kame-Terrace deposits consist primarily of silty sand and pebbly-to cobble-sized gravel. Groundwater flow beneath the site appears to follow the topography, flowing downslope and discharging into the Green River (Figure 3). The groundwater in the Green River Valley follows the Green River to the north. A ridge is located west of the Bow Lake site. The area west of the site is considered part of the Pleistocene Vashon drift, which is composed primarily of clays, silts, sands, and gravels. Regional groundwater in the Pleistocene deposits flows west toward Puget Sound as shown in Figure 3.

According to available well logs obtained by PRC from Ecology, only one groundwater well is located hydraulically downgradient of the landfill, between the landfill and the Green River. This well, owned by M.A Segale, Inc. is not a drinking water well and is currently not used for any purpose. PRC assumed that the Green River provides a hydrogeologic barrier to groundwater flow, so groundwater wells east the river are not hydraulically connected to the groundwater underneath the landfill. Approximately 55 groundwater wells are located within the 4-mile radius surrounding the landfill and west of the Green River. Of these, at least 14 are domestic wells, and three are irrigation wells. Municipal wells owned by King County Water Districts 54 and 75 are located approximately 2.5 miles southwest of the landfill. Based on the Ecology and Environment, Inc. (E&E) inspection site report (1988), these wells were assumed to provide drinking water to 75,000 people. The E&E report estimated that 50,000 people used these wells; however, the value was increased by 50 percent to account for any population increase in the past 5 years. Because groundwater underlying the landfill is assumed to move east towards the Green River, it is assumed that these wells are upgradient of the site.

In 1984, the King County Health Department conducted a survey of its abandoned landfills, which included the Bow Lake site. The primary objective was to determine whether any public health problems existed at the site. A follow-up investigation conducted in 1986 included examining surface waters, surface soils, and subsurface landfill gases for the presence of hazardous substances, that could pose a health threat to an on-site worker or site visitor.

During a surface water sampling program conducted in June 1986, no surface water or evidence of leachate seeps were observed. During a subsequent survey conducted in July 1986 as part of a soil sampling program, a slow surface water stream with an oily sheen was discovered at the southern end of the site. A sediment sample was retrieved for analysis from this source. No contaminants were detected above background at this source. Contaminants detected above background during the soil sampling program include bis (2-ethylhexyl) phthalate (0.9 milligram per kilogram [mg/kg]), lead (160 mg/kg), cyanide (2.1 mg/kg), mercury (0.4 mg/kg), and zinc (410 mg/kg). Other contaminants, including trichloroethene, benzoic acid, phthalates, polyaromatic hydrocarbons, aldrin, and 4,4'-dichlorodiphenyldichloroethane were detected



above background in estimated concentrations. Combustible gas measurements indicated that the landfill is generating combustible gases on the north and east perimeters. No leachate seeps were observed at the base of the steep slope during this investigation.

During the 1984 study, a leachate seep was observed at the southeastern portion of the site. However, during the 1986 follow-up investigation, no evidence of this seep was observed. According to the KCSWD, this was controlled by adding a landfill cap and diverting water runoff from the area. Similarly, no leachate seeps were observed during sanitation surveys conducted by the King County Department of Health in March, April, and July 1993.

Sources

As indicated previously, no records indicate that Bow Lake Landfill accepted any commercial hazardous wastes. However, the municipal solid waste stream does contain hazardous wastes such as paint thinners, drain cleaners, and pesticides that would have been disposed of at the landfill. Based on the 1950s acceptance rate of 160,000 cubic yards (yd³) per year for 18 years, the volume of solid waste would be 3,000,000 yd³. Based on the limited environmental samples available, there is potential for arsenic, beryllium, chromium, chrysene, and benzo (b) fluoranthene contamination.

Recommendations

Seattle-King County Department of Public Health conducts monthly sanitary surveys of the site. This will allow for continuing observation for leachate seeps. KCSWD has money budgeted for voluntary investigation and remediation at its abandoned landfills for the next 5 years; however, the Bow Lake site is the lowest priority. It is recommended that groundwater monitoring be conducted in the future by KCSWD or EPA. Either monitoring wells should be installed or the well owned by M.A. Segale, Inc. should be sampled.

Information Sources

Information used to score this site was derived from the following documents contained in the EPA site file:

Ecology and Environment, Inc. 1988. Site Inspection Report for King County Bow Lake Landfill, Tukwila, Washington. Prepared for U.S. Environmental Protection Agency. December.

Seattle-King County Department of Public Health 1985. Abandoned Landfill Study in King County. January.

The following documents were also reviewed:

Seattle-King County Department of Public Health 1986. Seattle-King County Abandoned Landfill Toxicity/Hazard Assessment Project. December.

Seattle-King County Department of Public Health 1993. Sanitary Survey Report. March and April 1993.

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U.S. Geological Survey topographic maps, The Thomas Guide for King County, well logs obtained from Ecology, and representatives from Seattle-King County Department of Public Health were also consulted.

The contact person for the King County Bow Lake Landfill is as follows:

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Solid Waste Division
Department of Public Works
400 Yesler Way, Room 600
Seattle, Washington 98104-2637

A Comprehensive Environmental Response, Compensation and Liability Act of 1980/National Priority List eligibility checklist is attached. Please contact me or Mary Bandrowski at 624-2692 if you have questions about this SIP.

Sincerely,



Neil Morton
Site Manager

Attachments

cc: Mary Bandrowski, PRC Project Manager